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“Knowledge is such a treasure which cannot be stolen”



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IS : 3740 - 1966  
( Reaffirmed 1977 )

*Indian Standard*

SPECIFICATION FOR TUBES,  
GLASS, FOR PATHOLOGICAL WORK

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI 110002

# Indian Standard

## SPECIFICATION FOR TUBES, GLASS, FOR PATHOLOGICAL WORK

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(Continued on page 2)

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*( Continued from page 1 )*

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# *Indian Standard*

## SPECIFICATION FOR TUBES, GLASS, FOR PATHOLOGICAL WORK

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 27 September 1966, after the draft finalized by the Medical Glass Instruments and Appliances Sectional Committee had been approved by the Consumer Products Division Council.

**0.2** Preparation of standards for surgical instruments, medical equipment and apparatus, including medical glass instruments has been taken up at the instance of the Advisory Committee for Development of Surgical Instruments, Medical Equipment and Appliances of the Ministry of Industry, Government of India.

**0.3** Varied patterns and sizes of glass tubes are in use in pathological work and this standard which covers types, sizes and other requirements is expected to help in providing uniform equipment to all laboratories.

**0.4** This standard is one of a series of standards on pathological glass apparatus. Other standards in the series are:

IS : 3741-1966 Specification for tubes, sedimentation.

IS : 3742-1966 Specification for pipettes, dilution, for haemocytometers.

**0.5** In the preparation of this standard, considerable assistance has been derived from the following standards:

IND/SL/MED/5850 (b) Tube, blood sugar, with bulb (Folin and Wu). Ministry of Defence, Government of India.

B.S. 625 : 1959 Bacteriological and agglutination test tubes. British Standards Institution.

DD-T-700 Tubes, antigen dilution, glass (Kahn). US Federal Supply Service.

NNN-T-170(a) Test tube, blood sugar determination. US Federal Supply Service.

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

\*Rules for rounding off numerical values (*revised*).

## 1. SCOPE

1.1 This specification covers the following glass tubes used for pathological tests:

- a) Tube, Folin Wu or Blood Sugar Determination;
- b) Tube for Kahn and Wasserman Tests;
- c) Tube, Antigen Dilution;
- d) Tube, Agglutination (Dreyer's);
- e) Tube, Durham Fermentation and Bacteriological; and
- f) Tube, Widal.

## 2. MATERIALS

2.1 The glass tube shall be made from clear, neutral heat-resistant glass (for definitions, *see* IS : 1382-1961\*). The glass shall pass the alkalinity test prescribed in IS : 2303-1963† for type 1 glass.

## 3. SHAPES AND DIMENSIONS

3.1 The shapes and dimensions of the various tubes shall be as given in Fig. 1 to 6.

## 4. CONSTRUCTION, WORKMANSHIP AND FINISH

4.1 **General Requirements** — The tubes shall be well-annealed, free from bubbles and as far as possible, free from striae, stones and other visible defects (for definitions, *see* IS : 1382-1961\*). They shall pass the thermal shock test specified in 7.1. The tubes shall be concentric and well formed. The top end shall be cut at right angles to the axis of the tube and may be flame-polished or be finished with a circular, well-formed rim.

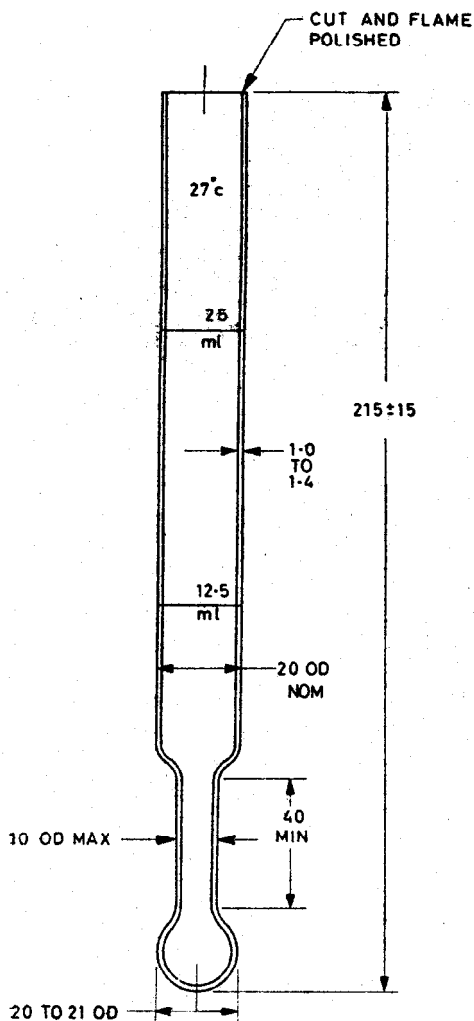
### 4.2 Specific Requirements

4.2.1 *Tube, Folin Wu* — The design of the tube shall be as shown in Fig. 1. The bulb at the lower end shall be of such a capacity that when 4 ml of a liquid is poured into the tube, the meniscus shall be between the top of the bulb and the middle of the constricted portion of the tube. It shall be graduated at 12.5 ml and 25.0 ml calibrated at 27°C. The tolerance at the capacity 12.5 ml and 25.0 ml shall be  $\pm 0.1$  ml. The graduations shall be etched all round the tube and filled with a permanent pigment.

\*Glossary of terms relating to glass industry.

†Method of grading glass for alkalinity.





All dimensions in millimetres.

FIG. 1 TUBE, FOLIN WU

**4.2.2 Tube for Kahn and Wasserman Tests** — The design of the tube shall be as shown in Fig. 2. The bottom of the tube shall be rounded. It shall be finished on the upper side without a rim. The internal diameter of the tube shall be uniform.

**4.2.3 Tube, Antigen Dilution** — The design of the tube shall be as shown in Fig. 3. The bottom of the tube shall be dished as shown in the figure so as to allow it to stand vertically when placed on a flat, level surface. It shall be square on the upper side and finished without a rim.

**4.2.4 Tube, Agglutination (Dreyer's)** — The tube shall have a funnel-shaped mouth and tapered end as given in Fig. 4.

**4.2.5 Tube, Durham Fermentation and Bacteriological** — The design of the tubes shall be as given in Fig. 5. The bottom of each tube shall be well rounded. The dimensions of the Durham Fermentation tube and the Bacteriological tube shall be as given in Fig. 5 read with Table 1 (see P 8 and 9).

**4.2.6 Tube, Widal** — The design of the tube shall be as given in Fig. 6. The top of each tube shall have a rim. The bottom shall be well rounded with uniform thickness.

## 5. MARKING

**5.1** The tubes shall be marked with the following:

- a) Name of the manufacturer or his trade-mark or initials; and
- b) The Folin Wu tube shall be marked with the inscription '27°C' to indicate that it is calibrated at 27°C.

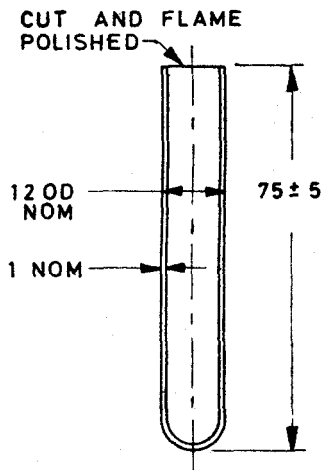
**5.1.1** The tubes may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 6. PACKING

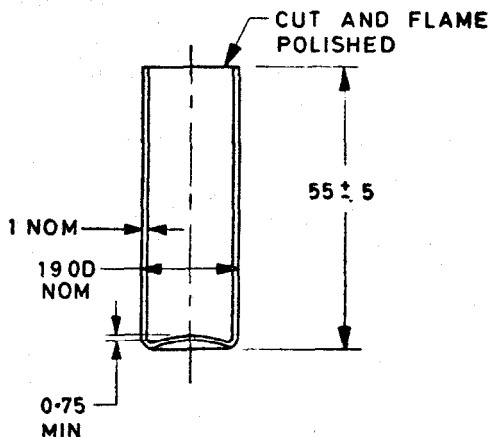
**6.1** The tubes may be packed as given below or as agreed to between the purchaser and supplier.

**6.1.1** The Folin Wu tube shall be wrapped in corrugated fibreboard. The other tubes shall be individually wrapped in tissue paper. Five of each kind shall be further wrapped in 10 mm thick layers of cotton and then in paper to form a bundle.



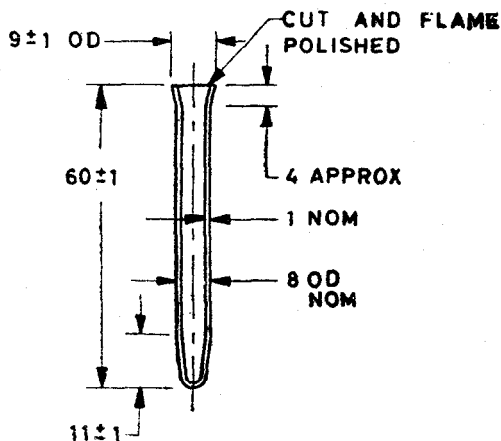
All dimensions in millimetres.

FIG. 2 TUBE FOR KAHN  
AND WASSERMAN TESTS



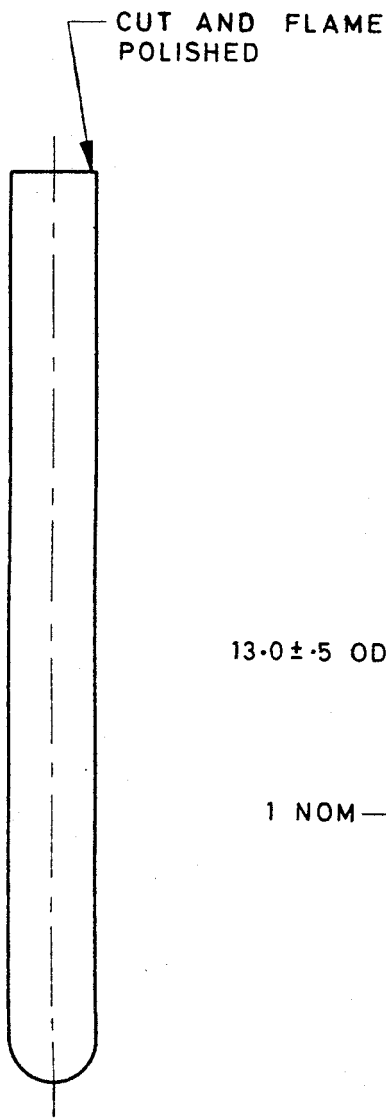
All dimensions in millimetres.

FIG. 3 TUBE, ANTIGEN DILUTION

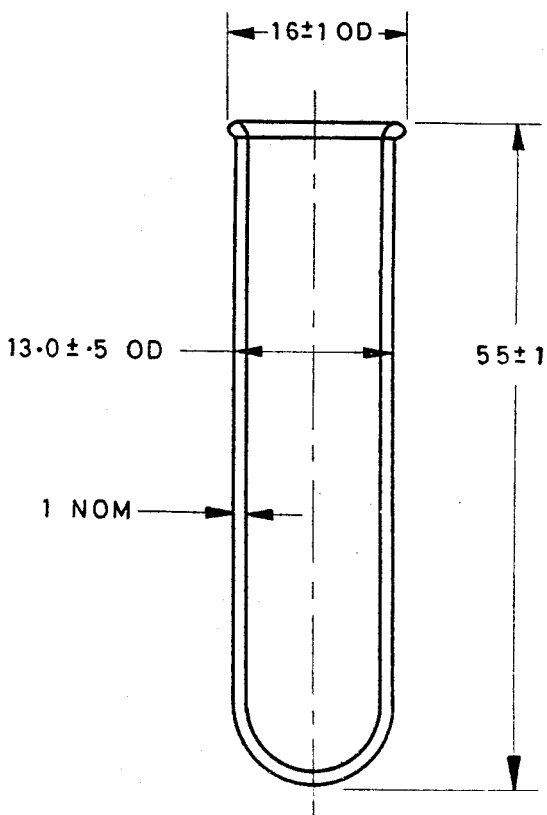


All dimensions in millimetres.

FIG. 4 TUBE, AGGLUTINATION (DREYER'S)



All dimensions in millimetres.  
FIG. 5 TUBE, DURHAM FERMENTATION AND BACTERIOLOGICAL



All dimensions in millimetres.  
FIG. 6 TUBE, WIDAL

**TABLE 1 DIMENSIONS OF DURHAM FERMENTATION TUBES AND BACTERIOLOGICAL TEST-TUBES**

( Clause 4.2.5 )

All dimensions in millimetres.

SIZE	OVERALL LENGTH	OUTER DIAMETER	WALL THICKNESS, NOMINAL
<i>Durham Fermentation Tubes</i>			
I	30 ± 1	6.00 ± 0.25	1.0
II	35 ± 1	8.00 ± 0.25	
III	50 ± 1	7.50 ± 0.25	
IV	60 ± 1	7.00 ± 0.25	
<i>Bacteriological Tubes</i>			
V	75 ± 1	10.0 ± 0.5	1.0
VI	75 ± 1	12.0 ± 0.5	
VII	100 ± 1	12.0 ± 0.5	
VIII	100 ± 1	16.0 ± 0.5	
IX	125 ± 2	12.0 ± 0.5	1.0
X	125 ± 2	19.0 ± 0.5	
XI	150 ± 2	16.0 ± 0.5	
XII	150 ± 2	19.0 ± 0.5	
XIII	150 ± 2	25.0 ± 1.0	1.0
XIV	175 ± 2	38.0 ± 1.0	

NOTE — Bacteriological test-tubes suitable for use with different sizes of fermentation tubes are as given below:

	Sizes		
	I	II	III, IV XI
Durham Fermentation tube	V, VI, VII, VIII, IX, X, XI	VIII, IX, X, XI	
Bacteriological test-tube			

## 7. TEST

**7.1 Thermal Shock Test** — The tubes shall be boiled in water for 30 minutes, then transferred into water at about 20°C. They shall not show any chipping or cracking.

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